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TOOTH CLEANER

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This invention relates to a Tooth Cleaner and, more particularly, to an inexpensive, disposable tooth cleaner for use by travelers and others in situations where use of the ordinary tooth brushing equipment is not convenient.

At the present time, it is customary for people to rely upon tooth brushes and tooth paste or tooth powder for the day to day cleansing of their teeth and gums. Tooth brushes are effective for this purpose, and, in the ordinary home environment, they are entirely satisfactory. However, the use of tooth brushes in other situations and environments frequently is inconvenient. The ordinary tooth brush, and the tooth paste for use with it, are of such bulk that is is inconvenient to carry them about from place to place. Moreover, after use, the bristles of the tooth brush are soft and wet. In order to restore the brush to a condition in which it will again be effective, it is necessary to dry the bristles. This can be accomplished only when the bristles are exposed to air, and such exposure usually is not possible as a practical matter when the brush is being carried about. During such periods, the tooth brushes ordinarily are protected against contamination by disposing them in cases of some kind.

These considerations have led to the proposal of various types of disposable tooth cleaning devices for use in situations where the ordinary tooth brush is not practical. One type, with which the present invention is particularly concerned, is in the form of a covering for the finger tip of the user of the device. After the c v ring is slipped ont th finger

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tip, the finger is inserted into the mouth and moved so as to rub the surface of the covering against the teeth and gums. This type has the advantage of minimizing bulk, and considerable effort has been directed toward its development. Yet, the results have not been entirely satisfactory.

Accordingly, an object of the present invention is to provide an improved finger tip tooth cleaner which will be inexpensive to construct and effective in use.

Another object of this invention is to provide an improved tooth cleaner which may be applied to finger tips of different sizes easily and yet which, during use of the cleaner, will grip the finger tip sufficiently to prevent relative motion between the finger tip and the cleaner as the cleaner is being rubbed against the teeth and gums.

A more specific object of the invention is to provide an inexpensive finger tip tooth cleaner which will contact and pucker upon being wet so as to enhance its effectiveness in tooth cleaning operations.

The foregoing objects may be accomplished according to a preferred embodiment of the invention, by providing a finger tip covering of paper and affixing thereto stretched elastic threads so arranged as to apply forces to the paper tending to cause contraction thereof. When the paper covering is dry, the paper is stiff enough to prevent contraction under the influence of the stretched elastic threads. In this condition of the material, the finger-receiving opening in the covering may be of substantial size so as to receive finger tips of different

sizes without difficulty. However, when water is applied to the paper covering, it loses much of its stiffness, and it then offers little resistance to contraction of the stretched elastic threads. This is an important characteristic of the present invention, in that it permits shrinking of the paper covering into firm holding engagement with the finger tip after the tip has been inserted into the opening in the covering. The shrinking of the covering also results automatically in the production of a puckered or pebbled surface configuration and enhances the cleaning capacity of the covering.

In one construction, the paper covering is formed from a blank in the shape of a strip. Elastic threads are affixed to the paper strip along transversely extending lines by a simple shirring operation which may be performed on an ordinary sewing machine by using elastic thread on the bobbin and ordinary sewing thread on the top spool. The elastic threads are placed under substantial tension during the stitching process so that they will be fixed to the paper in a stretched condition. The tension in the elastic threads causes these threads to be disposed entirely, or almost entirely, upon one surface of the paper strip.

The next step in forming the tooth cleaner is to fold the strip about a transversely extending, centrally located, line so as to position one layer of stitched paper above another layer of stitched paper. It is preferred that this step be carried out so that the adjacent faces of the two layers are those faces upon which the elastic threads are located. A pocket then is formed by stitching the two layers together along their lateral

margins. This stitiching operation preferably is carried out by the use of elastic threads so as to give the article an additional capacity for contraction.

The tooth cleaner may be packed in a flat condition, with the two plies of layers extending parallel to each other. In the flat condition, the article is very compact and easy to carry about from one place to another. It may also be protected against contamination by a plastic bag or container of some kind, if desired.

When the article is to be used, the paper may be flexed to open the pocket between the two layers, and the finger tip may be inserted into the pocket. Then the device is immersed in water to soften the paper sufficiently to permit contraction of the elastic threads. As the elastic threads contract, they shrink the paper into firm engagement with the finger tip and they also bear directly upon the finger tip itself because of their disposition on the interior faces of the layers. This shrinking action assures that the article will be held securely in place upon the finger tip during the subsequent tooth cleaning operation.

Shrinking of the cleaner also is accompanied by a puckering of the paper. Bumps, ridges, and other irregularities in surface pattern appear. These irregularities present laterally directed surface portions which greatly increase the abrasive characteristices of the cleaner and facilitate the cleaning operation substantially.

Although the tooth cleaner may be used in the form described above, it is preferred that a dentifrice be incorporated in the paper itself so that an additional cleansing effect will be produced when the paper is wet and the dentifrice becomes active. A still further enhancement of the cleaning potentialities of the article may be obtained by serrating the lateral edges of the paper layers. These serrated edges then form projecting portions which may be employed to stimulate the gums as the paper is rubbed against the teeth.

This embodiment of the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a view illustrating the manner in which the tooth cleaner of the present invention may be used;

Fig. 2 is a plan view of the tooth cleaner construction as it appears prior to shrinking;

Fig. 3 is a plan view of the tooth cleaner construction as it appears after shrinking;

Fig. 4 is a greatly enlarged plan view of a small portion of the tooth cleaner shown in Fig. 2, with the upper layer of material being broken away to reveal the interior construction;

Fig. 5 is a detail cross sectional view taken along the line 5-5 in Fig. 4; and

Fig. 6 is a cross sectional view taken along the line 6-6 in Fig. 2.

Since Figs. 2, 4, 5 and 6, illustrate the construction of the tooth cleaner as manufactured and prior to use, it will be helpful to refer initially to these views. The illustrated tooth cleaner 10 is formed of paper and includes correspondingly shaped, substantially flat, upper and lower layers 12 and 14 disposed one above the other. Each of these layers 12 and 14 preferably is tapered toward the outer end of the article and is provided with serrated lateral edges 16. A line of stitching 18 extends along the lateral margins of the cleaner 10 and along the outer end thereof to connect the upper and lower layers 12 and 14 together in these zones. As shown in Fig. 6, the upper and lower layers 12 and 14 are not connected together at the inner end portion of the article 10, so that access to the pocket or opening 20 between the two layers 12 and 14 may be had through the inner end of the article.

The tooth cleaner 10 is given a capacity for contraction by affixing to each of the individual layers 12 and 14 a plurality of transversely extending elastic threads. In the drawings, reference numeral 22 has been applied to rows of stitching by which the elastic threads are secured to the paper layers 12 and 14. Although the spacing of the rows 22 obviously may be varied, it may be stated that good results have been obtained by using six of the rows 22 to the inch.

Each row 22 of stitching is made up of a stretched elastic thread 24 and an inelastic sewing thread 26. Stitching preferably is accomplished by the use of an ordinary sewing machine, and the thread tensions are so adjusted that the elastic thread 24 will lie substantially upon on surface of the paper

layer 12 or 14 being stitched while the inelastic thread 26 passes back and forth between the two surfaces of the layer to securely fix the elastic thread 24 in place. About twenty stitches per inch has been found to be a satisfactory stitch density.

A convenient procedure for forming the tooth cleaner 10 is to stamp from sheet stock a blank in the form of a strip which can be folded over along a centrally located, transversely extending line to provide the superposed layers 12 and 14. Before the folding operation, however, the rows 22 of stitching should be applied to the blank. Then, when the blank is folded, as suggested by the numeral 28 in Fig. 2, the elastic threads 24 preferably are located on the confronting faces of the two layers 12 and 14. In other words, the elastic threads 24 preferably are positioned so as to contact directly a finger inserted into pocket 20 of the cleaner 10. After folding, the fabrication process may be completed by stitching the layers 12 and 14 together along the line 18.

A suitable dentifrice preferably is incorporated in the article 10 so as to enhance its effectiveness in cleansing the teeth and refreshing the mouth of the user. The dentifrice may be any of a variety of known compositions and it may be applied by several methods. For example, the paper may be impregnated with an alcohol tooth paste solution, or the surface of the paper may be coated with a mixture of gelatin and water soluble tooth paste or powder. It is sufficient also to merely apply a film of tooth paste to the paper and allow it to dry. If the dentifrice is applied in a manner which would result in wetting of the paper, this step should be performed prior to the affixing of the stretched elastic threads 24 so as to avoid undesired

shrinkage of the article 10 prior to insertion of the user's finger into the pocket 20.

The paper from which the upper and lower layers 12 and 14 are formed may be of a standard commercial type. For best results, a rough textured, high wet strength paper should be selected. Good results have been obtained, for example, by employing grade #949 paper obtained from Eaton Dikeman Co. of Mt. Holly Springs, Pennsylvania.

The relative stiffness of the paper when dry and when wet is a factor which must be considered in connection with the forces developed by the elastic threads 24 utilized in the article 10. The paper must be stiff enough when dry to hold the stretched eleastic threads 24 against substantial contraction, as indicated in Fig. 2. However, wetting of the paper must soften it sufficiently to allow the elastic threads 24 to contract toward their unstressed conditions so as to shrink the article 10, as indicated in Fig. 3.

It will be observed that the actual amount of shrinkage in the article 10 is a function of the stretch imparted to the elastic threads 24 prior to fixing them to the paper layers 12 and 14. With the commercially available elastic threads, this may be very substantial. For example, rubber threads which will stretch one hundred and fifty per cent or more without permanent deformation are well known. When highly stretched elastic threads are employed in the article 10, a single size will be satisfactory for a large number of people. That is to say, the pocket 20 may be mad large enough to receive asily th larg st fing rs which are anticipat d without r nd ring the

article 10 unsuitable for use on smaller fingers, because of the large capacity for shrinking. Of course, the shrunk article 10 of Fig. 3 will grip a large finger more firmly than a small finger, but this variation is of no real importance so long as the grip is sufficient to hold the article 10 in place while the teeth are being cleaned.

Contraction of the elastic threads 24 when the article 10 is immersed in water results in a pronounced puckering effect in the softened paper layers 12 and 14, as illustrated in Figs. 1 and 3. Thus, as the size of the finger-receiving pocket 20 diminishes to grip the finger tip, the surfaces of the layers 12 and 14 become irregular so that a multitude of variously directed surface protrusions become available for abrasive contact with the teeth. This puckering action may be enhanced by utilizing stretched elastic thread in forming the line of stitching 18 by which the two layers 12 and 14 of paper are secured together to make the pocket 20. When this elastic thread contracts, it tends to draw the paper in directions at angles to the transverse rows 22 so as to increase the irregularity of the puckering.

After wetting and shrinking of the article 10, the serrated edges 16 are neither unyielding nor sharp, but they do have sufficient stiffness to make them desirable for massaging the gums. The serrated edges 16 also can be useful on occasion in cleaning between teeth.

Although a single embodiment of the invention has been illustrated and described in detail, various modifications will suggest themselves readily to persons skilled in the art. For example, the two paper layers 12 and 14 may be formed from

separate blanks, rather than from a single blank folded along the line 28. Also, it will be evident that, if desired, an adhesive or other suitable means may be employed in lieu of stitching for securing the two layers 12 and 14 together and for affixing the stretched eleastic threads 24 to the paper. Still other variations obviously may be made without departing from the invention, and it is intended, therefore, that the foregoing description be considered as exemplary only. The scope of the invention is to be ascertained from the following claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A finger tip cover comprising a body of material shaped to provide a pocket for receiving the finger tip of the user, and eleastic means secured to said material in stretched condition, said material being stiff enough when dry to hold said stretched elastic means against contraction and being flexible enough when wet to permit contraction of said elastic means to shrink said pocket into holding engagement with the finger tip of the user.

2. A finger tip tooth cleaner comprising upper and lower layers of sheet material connected together so as to provide a pocket open at one end for receiving the finger tip of the user of the cleaner, and stretched elastic means fixed to said layers, said layers being stiff enough when dry to hold said stretched elastic means against contraction and being flexible enough when wet to permit contraction of said elastic means to shrink said pocket.

3. A finger tip tooth cleaner comprising upper and lower layers connected together along their lateral margins so as to provide a pocket for receiving the finger tip of the user of the cleaner, and an elastic thread extending laterally across one of said layers and being fixed to such layer in stretched condition, said one layer being formed of paper stiff enough when dry to hold said elastic thread in stretched condition so that the finger tip of the user may b ins rt d int said pock t asily and b ing soft n ugh wh n wet to permit contraction of said elastic thread t ward its unstressed c nditi n so as t

shrink the pocket into firm holding engagement with the finger tip of the user and pucker the paper into an irregular surface pattern presenting projections for contracting the teeth during use of tne cleaner.

4. A finger tip tooth cleaner comprising upper and lower layers of paper, stretched eleastic thread means stitched to said layers along their lateral margins to connect such margins together so as to provide a pocket for receiving the finger tip of the user of the cleaner, and a plurality of spaced rows of additional elastic thread means each extending laterally across one of said layers and being fixed to such layer in stretched condition, said paper being stiff enough when dry to hold said elastic thread means in stretched condition so that the finger tip of the user may be inserted into said pocket easily and being soft enough when wet to permit contraction of said elastic means to shrink the pocket into firm holding engagement with the finger tip of the user and pucker the paper into an irregular surface pattern presenting projections for contacting the teeth during use of the cleaner.

5. A finger tip tooth cleaner comprising upper and lower paper layers connected together along their lateral margins so as to provide a pocket for receiving the finger tip of the user of the cleaner, a dentifrice carried by said paper, and a plurality of spaced rows of stretched elastic threads stitched to each of said layers and extending across said pocket, said paper being stiff enough when dry to hold the elastic threads in str tch d conditi n so that th fing r tip f th us r may b inserted int said pock t easily and being s ft nough when wet to

permit contraction of said elastic threads to shrink the pocket into firm holding engagement with the finger tip of the user and pucker the paper into an irregular surface pattern presenting projections for contacting the teeth during use of the cleaner.

6. A finger tip tooth cleaner comprising superposed upper and lower layers of paper, each of said layers being tapered toward its outer end and having serrated lateral edges, a plurality of stretched elastic threads adjacent to and extending across the lower surface of said upper layer, a plurality of stretched elastic threads adjacent to and extending across the upper surface of said lower layer, inelastic thread means stretched to said layers and holding said stretched elastic threads in place on the adjacent surfaces of said layers, a row of stitching including a stretched elastic thread and extending around the lateral margins and the outer ends of said layers to secure said layers together so as to form a pocket for receiving the finger tip of the user of the cleaner, and a dentifrice carried by said paper, said paper being stiff enough when dry to hold said elastic threads in stretched condition so that the finger tip of the user may be inserted into the pocket easily and being soft enough when wet to permit contraction of said elastic threads toward their unstressed conditions so as to shrink the pocket into firm holding engagement with the finger tip of the user and pucker the paper into an irregular surface pattern presenting projections for contacting the teeth during use of the cleaner.

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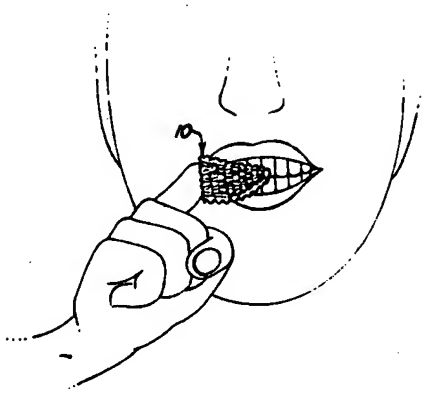

Fig. 1

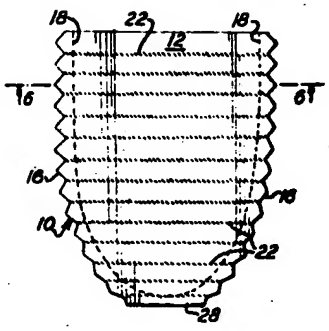

Fig. 2

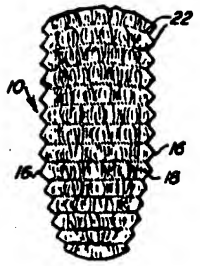

Fig. 3

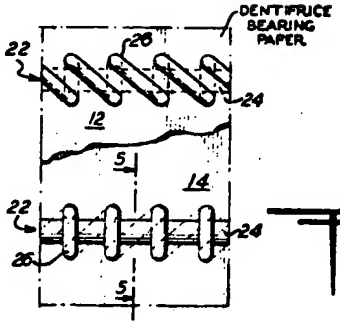

Fig. 4

Fig. 5

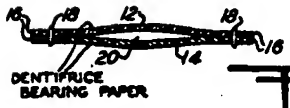

Fig. 6